UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/712,181 | 11/13/2003 | Jiebo Luo | 87279DMW | 7890 |

|  |  |
|---|---|
| 7590  01/29/2007 | EXAMINER |
| Pamela R. Crocker | KRASNIC, BERNARD |
| Patent Legal Staff | |
| Eastman Kodak Company | |

| | ART UNIT | PAPER NUMBER |
|---|---|---|
| 343 State Street | 2609 | |
| Rochester, NY 14650-2201 | | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 01/29/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) _1-11_ is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-11_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☒ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some * c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____.

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _11-13-2003 and 2-24-2005_.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1.      Applicant is reminded of the proper language and format for an abstract of the disclosure.

        The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

        The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2.      The abstract of the disclosure is objected to because it is not narrative. It consists and has been drafted as one long run-on sentence, much like claim 1, which is improper. The intent of the abstract is to give a concise but brief statement of the disclosure or the invention as a whole consisting of a series of complete sentences forming a single paragraph.

Correction is required.  See MPEP § 608.01(b).

3.      The disclosure is objected to because of the following informalities:

        Page 8, line 26: "FIG 3" should be -- FIG 3b --.

Appropriate correction is required.

## Claim Objections

4.      Claims 4-9, and 11 are objected to because of the following informalities:

Claims 4 and 5, line 3 respectively: The end of the claim should be followed by a

period.  "consecutive images" should be -- consecutive images. --.

Claims 6 and 7, line 3 respectively: "on the previous image" should be -- on a

previous image --.

Claims 8 and 9, lines 2-3 respectively: "on both the previous and" should be -- on

both a previous and --.

Claim 11, line 2: "using the belief propagation algorithm" should be -- using a

belief propagation algorithm --.


Appropriate correction is required.


## Claim Rejections - 35 USC § 112

5.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.


6.      Claims 7 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Re Claim 7:  Claim 7 is the exact replicate of its dependent claim 6, making this

claim indefinite.

Re Claim 9:  Claim 9 is the exact replicate of its dependent claim 8, making this

claim indefinite.

Appropriate correction is required.

### Claim Rejections - 35 USC § 102

7.     The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8.     Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by

Simpson ("A recurrent neural network classifier for improved retrievals of areal extent of

snow cover" - IEEE - vol 39, Oct 2001, pages 2135-2147).

Re Claim 1: Simpson discloses a method / single image classification using feed-

forward neural networks (FFNN) and image sequence classification using recurrent

neural networks (RNNCCS) (see pages 2138-2139, section B. Present Approaches) for

improving scene classification of a sequence of digital images / sequence of snow cover

images comprising the steps of (a) providing a sequence of images captured in

temporal succession / temporal sampling into time series (see page 2139, section 2 -

Image Sequence Classification Using Recurrent Neural Networks, first paragraph); (b)

classifying each of the images individually / Single Image Classification using Feed-

Forward Neural Networks (FFNN) based on information / spectral and textural

contained in the individual image to generate a first image classification (see page 2138, section 1 - Single Image Classification Using Feed-Forward Neural Networks, first paragraph); and (c) imposing a pre-determined temporal context model / Recurrent Neural Network (RNNCCS) on the sequence of images / sequence of snow cover temporal sampling into time series images to generate a final image classification (see page 2139, section 2 - Image Sequence Classification Using Recurrent Neural Networks, first paragraph, the RNNCCS uses "short term memory" of both texture and classification data from the previous image(s) to do a final classification on the current image being analyzed).

Re Claim 2: Simpson discloses the information used in step (b) includes pixel information / spectral and textural (see page 2138, section 1 - Single Image Classification Using Feed-Forward Neural Networks, first paragraph).

Re Claim 5: Simpson discloses the pre-determined temporal context model in step (c) is dependent on elapsed time / temporal sampling into time series between consecutive images (see page 2139, section 2 - Image Sequence Classification Using Recurrent Neural Networks, first paragraph, the RNNCCS uses the twelve daylight scenes per day sequence of images in a time series manner for further improvement in classification).

## *Claim Rejections - 35 USC § 103*

9.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

10.     Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson

in view of Tretter et al (US 6,977,679 B2). The teachings of Simpson are discussed

above.

However, Simpson fails to teach the information used in step (b) includes

metadata information.

Tretter, <u>as recited in claim 3</u>, discloses the information used in step (b) includes

metadata / focusing distance information (see abstract, lines 6-13).

Therefore, in view of Tretter, it would have been obvious to one of ordinary skill in

the art at the time the invention was made to modify Simpson's step (b) of classifying

each image individually by including focusing distance metadata in order to enhance the

classification of snow cover by further distinguishing clouds and snow cover by

identifying the difference in distance between clouds and the snow cover from the

satellite which captures images.

11.     Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson.

The teachings of Simpson are discussed above.

Although the pre-determined context model of Simpson is disclosed as

depending on elapsed time between consecutive images and is not specifically

disclosed, as recited in claim 4, as being independent of elapsed time between

consecutive images, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have such a feature of independency in elapsed time

because the elapsed time between Simpson's satellite consecutive images could be

irregularly spaced or not evenly time spaced as long as the consecutive images are

produced as twelve daylight scenes per day in order to capture the more detailed and

more visible images of snow cover during one point of the day and fewer during the rest

of the day.


12.     Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Simpson in view of Huang ("Integration of multimodal features for video scene

classification based on HMM" - IEEE - Sept 1999, pages 53-58).  The teachings of

Simpson are discussed above.

However, Simpson fails to teach that the temporal context model is a causal

Hidden Markov Model, that the temporal context model is a non-causal model, that the

temporal context model is imposed using a Viterbi algorithm, and that the temporal

context model is imposed using a belief propagation algorithm.

Huang, as recited in claims 8 and 9 respectively, discloses the pre-determined

temporal context model is a non-casual model / discrete ergodic Hidden Markov Model

dependent on both the previous and subsequent images / visited from any state (see

page 55, section Product HMM, page 56, section SIMULATION RESULTS, second

paragraph, the discrete ergodic HMM visits any states or images from any state or

image which makes the model non-causal).

Therefore, in view of Huang, it would have been obvious to one of ordinary skill in

the art at the time the invention was made to modify Simpsons temporal context model

by replacing it with a non-causal discrete ergodic Hidden Markov Model in order to give

more correlation data between all the images of the sequence instead of just a few

images (images before the current image) to further improve the accuracy of the

classification.

Although Simpson's temporal context model in view of Huang's modifications

teaches a non-causal discrete ergodic Hidden Markov Model, it does not specifically

disclose, as recited in claims 6 and 7 respectively, that the temporal context model is

the causal Hidden Markov Model dependent on the previous image, and it does not

specifically disclose, as recited in claim 10, that the temporal context model is imposed

using Viterbi algorithm, and it does not specifically disclose, as recited in claim 11, that

the temporal context model is imposed using a belief propagation algorithm. It would

have been obvious to one of ordinary skill in the art at the time the invention was made

though to have such a feature of causality in a HMM model, a Viterbi algorithm, or a

belief propagation algorithm for a temporal context model because they are just other

methods of computing the probability for classification of a particular sequence which

Huang's non-causal Hidden Markov Model is basically accomplishing.

## *Conclusion*

13.     The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kowald et al discloses a visual language classification system; Foote et al discloses methods and apparatuses for video segmentation, classification, and retrieval using image class statistical models; Foote et al discloses methods and apparatuses for interactive similarity searching, retrieval, and browsing of video; Nicponski et al discloses a method and system for processing images for themed imaging services; Nefian et al discloses a coupled hidden markov model for audiovisual speech recognition; Niikura et al discloses a method and device for classifying video blocks; Huang discloses joint video scene segmentation and classification based on hidden Markov model; Szummer discloses indoor-outdoor image classification; Schuster discloses fast online video image sequence recognition with statistical methods; Morguet discloses feature extraction methods for consistent spatio-temporal image sequence classification using hidden Markov models; Saitwal discloses a multichannel temporally adaptive system for continuous cloud classification from satellite imagery; Savakis discloses indoor vs. outdoor classification of consumer photographs using low-level and semantic features; Vasconcelos discloses a Bayesian framework for semantic content characterization; Baik discloses online model modification for adaptive texture recognition in image sequences; Kane discloses Bayesian network structure learning and inference in indoor vs. outdoor image classification.

14.     Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357.  The examiner can normally be reached on Mon-Thur 8:00am-3:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044.  The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.  Status information for published applications may be obtained from either Private PAIR or Public PAIR.  Status information for unpublished applications is available through Private PAIR only.  For more information about the PAIR system, see http://pair-direct.uspto.gov.  Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).  If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Bernard Krasnic
January 17, 2007

JONG SUK LEE
SUPERVISORY PATENT EXAMINER